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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/039,187
Filing Date: December 31, 2001
Appellant(s): YU ET AL.

Michael Wallace
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 12/15/2009 appealing from the Office action mailed 7/28/2009.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The Examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The Appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is deficient. 37 CFR 41.37(c)(1)(v) requires the summary of claimed subject matter to include: (1) a concise explanation of the subject matter defined in each of the independent claims involved in the appeal, referring to the specification by page and line number, and to the drawing, if any, by reference characters and (2) for each independent claim involved in the appeal and for each dependent claim argued separately, every means plus function and step plus function as permitted by 35 U.S.C. 112, sixth paragraph, must be identified and the

structure, material, or acts described in the specification as corresponding to each claimed function must be set forth with reference to the specification by page and line number, and to the drawing, if any, by reference characters. The brief is deficient because page 4, lines 9-15, of the Specification does not teach determining a second surface of a drawing comprises a second plurality of curves constituting a first N x M surface condition as indicated on page 9, lines 3-7, with regards to claim 24, and on page 11, lines 11-15, with regards to claim 35 of the Brief. A step of determining a second surface as claimed is not explicitly taught, however page 19, lines 6-30 of the Specification teaches modifying surface conditions of surfaces 38 and 46 into the N x M format by generating auxiliary curves so that continuity conditions are met so that the surface resulting from the auxiliary curve is joined with any adjacent surface so that a surface defined by the auxiliary curve presents an appearance of continuity with surface 34 and 42 implicitly teaches a step of determining a second N x M surface as claimed.

(6) Grounds of Rejection to be Reviewed on Appeal

The Appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

Maya Unlimited 2.0, User's Guide © 1998-1999, 59 pages,

http://caad.arch.ethz.ch/info/maya/manual/MasterIndex.html.

5,619,625	Konno et al.	4-1997

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 24-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maya Unlimited 2.0, User's Guide © 1998-1999, 59 pages, in view of Konno et al. U.S. Patent No. 5619625.

Referring to claim 24, Maya Unlimited 2.0 teaches a method for interfacing with multiple surfaces within a computer-aided drawing environment, comprising:

using a computer system, determining that a first surface of a drawing comprises a first plurality of curves constituting a P x 1 surface condition, a P x 1 surface condition being defined by a number of first curves equal to P and only one second curve, wherein P is an integer greater than zero (Pages 20-21, Extruding Surfaces; Pages 21-

22, Choosing the extrude style; Page 34, Adding curves to Lofted surfaces; Page 43, Using the Birail 1 Tool, i.e. once an NxM surface has been generated via extrusion, lofting or the Birail Tools, it is understood that additional curves may be added/selected such that a first surface having a Px1 surface condition is determined, see page 16, Installing Maya and Transition Guide for Maya IRIX Users; page 17, About This Book, i.e. it is understood that instructions for installing software and using the software with either the Windows NT operating system or IRIX indicates that the Maya software is installed in a computer system executing the method steps as described);

using a computer system, determining that a second surface of a drawing comprises a second plurality of curves constituting a first N x M surface condition, a first N x M surface condition being defined by a number of third curves equal to N and a number of fourth curves equal to M, wherein N and M are integers greater than one (Pages 20-21, Extruding Surfaces; Pages 21-22, Choosing the extrude style; Page 34, Adding curves to Lofted surfaces; Page 43, Using the Birail 1 Tool, i.e. once an NxM surface has been generated via extrusion, lofting or the Birail Tools, it is understood that additional curves may be added/selected such that a first surface having a Px1 surface condition is determined adjacent to a second NxM surface having a first NxM surface condition defined by a number of third curves equal to N and a number of fourth curves equal to M wherein N and M are integers greater than one, see page 16, Installing Maya and Transition Guide for Maya IRIX Users; page 17, About This Book, i.e. it is understood that instructions for installing software and using the software with either the

Windows NT operating system or IRIX indicates that the Maya software is installed in a computer system executing the method steps as described);

using a computer system, converting the P x 1 surface condition of the first surface into a second N x M surface condition, the second N x M surface condition being defined by a number of fifth curves equal to N and a number of sixth curves equal to M, wherein N and M are integers greater than one; constructing an N x M surface under the second N x M surface condition (Page 34, Adding curves to Lofted surfaces; Page 43, Using the Birail 1 Tool, i.e. curves are added adjacent to an NxM lofted surface such that a Px1 surface condition is identified and then an NxM surface is generated adjacent to the existing NxM surface wherein the second NxM surface is defined by a number of fifth curves equal to N and a number of sixth curves equal to M, see page 16, Installing Maya and Transition Guide for Maya IRIX Users; page 17, About This Book, i.e. it is understood that instructions for installing software and using the software with either the Windows NT operating system or IRIX indicates that the Maya software is installed in a computer system executing the method steps as described); and

using a computer system, modifying the second N x M surface to edit a drawing (Pages 28-30, Editing the extruded surface using manipulators; Page 39, Editing part of a Lofted Surface; Page 48-49, Editing the Single Birail in the Attribute Editor, i.e. all of the NxM surfaces generated via the Extrude, Loft and Birail Tools may be modified to edit a drawing, see page 16, Installing Maya and Transition Guide for Maya IRIX Users; page 17, About This Book, i.e. it is understood that instructions for installing software

and using the software with either the Windows NT operating system or IRIX indicates that the Maya software is installed in a computer system executing the method steps as described).

Maya Unlimited 2.0 does not specifically teach wherein converting the P x 1 surface condition of the first surface into a second N x M surface condition, wherein the second NxM surface condition is converted to match the NxM surface condition of the second surface as claimed.

Konno et al. teaches generating auxiliary curves that are substantially continuous with any adjoining surfaces of a surface such that the NxM surface condition of a first surface matches the NxM surface condition of a second surface (Figs. 20-21; column 5, lines 20-29 and 35-48, i.e. the G^1 continuity of the boundary curve is checked at the endpoints and saved in memory and then used as the condition of continuity when generating auxiliary curves thereby ensuring that the auxiliary curve is continuous with any adjoining surfaces of the surface for which the auxiliary curve is generated thus indicating that a first NxM surface generated adjacent to a second NxM surface would have a NxM surface condition to match the second NxM surface condition of the second surface in order to ensure continuity between the adjacent surfaces).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Maya Unlimited 2.0 to include the teachings of Konno et al. thereby providing a free-form surface generation method that has the following advantageous features; (1) joining smoothly two adjacent free-form surfaces sharing a boundary curve of any type (e.g., composite curve) by creating

interior control points determined by the condition of connection on the boundary, which is derived from the condition of continuity on the boundary, which is determined by the boundary curve and other curves connected thereto; (2) generating free-form surfaces smoothly connected to each other by creating the control points for all the boundary curves and combining those control points; (3) generating a free-form surface in (2) which is smoothly joined to adjacent Gregory patches; (4) generating a free-form surface in (2) which is smoothly joined to adjacent rational boundary Gregory patches; (5) representing complex curve mesh by as few curves as possible in (2); (6) interpolating only one, if possible, surface into curve mesh in (2); and (7) keeping C^n continuity on a surface within the boundary curves (Konno et al. column 3, lines 8-27).

Referring to new claim 25, the rationale for claim 24 is incorporated herein, Maya Unlimited 2.0, as modified above, teaches the method of Claim 24, wherein converting the P x 1 surface condition of the first surface into the second N x M surface condition further comprises generating at least one auxiliary curve that is compatible with the number of first curves and the only one second curve that define the P x 1 surface condition (see page 20, second figure, i.e. the extruded auxiliary curves are known to be identical to the profile curve and thus have the same degree and number of knots thus indicating their compatibility with the profile curves from which they are extruded) but does not specifically teach generating at least one auxiliary curve that is substantially continuous with any adjoining surfaces of a surface having the P x 1 surface condition.

Konno et al. teaches generating at least one auxiliary curve that is substantially continuous with any adjoining surfaces of the first surface (Figs. 20-21; column 5, lines 20-29 and 35-48, i.e. the G^1 continuity of the boundary curve is checked at the endpoints and saved in memory and then used as the condition of continuity when generating auxiliary curves thereby ensuring that the auxiliary curve is continuous with any adjoining surfaces of the surface for which the auxiliary curve is generated).

The rationale for combining Maya Unlimited 2.0 with the teachings of Konno et al. as found in the motivation statement of claim 24 is incorporated herein.

Referring to claim 26, the rationale for claim 24 is incorporated herein, Maya Unlimited 2.0, as modified above, teaches the method of Claim 24, wherein converting the P x 1 surface condition of the first surface into the second N x M surface condition further comprises replacing the P x 1 surface condition with the second N x M surface condition (Pages 20-21, Extruding Surfaces; Pages 21-22, Choosing the extrude style, i.e. a plurality of profile and guiding/path curves are extruded from the input profile and path curves in order to generate an NxM surface thereby creating an N x M surface condition to replace the Px1 surface condition).

Konno et al. teaches generating at least one auxiliary curve that is substantially continuous with any adjoining surfaces of the first surface (Figs. 20-21; column 5, lines 20-29 and 35-48, i.e. the G^1 continuity of the boundary curve is checked at the endpoints and saved in memory and then used as the condition of continuity when generating auxiliary curves thereby ensuring that the auxiliary curve is continuous with any adjoining surfaces of the surface for which the auxiliary curve is generated).

The rationale for combining Maya Unlimited 2.0 with the teachings of Konno et al. as found in the motivation statement of claim 24 is incorporated herein.

Referring to claim 27, the rationale for claim 24 is incorporated herein, Maya Unlimited 2.0, as modified above, teaches the method of claim 24 wherein converting the Px1 surface condition into an N x M surface condition comprises generating an NxM surface condition defined by the third and fourth curves such third and fourth curves are defined by mathematical equations all having an order no greater than mathematical equations defining the first and second curves (Pages 20-21, Extruding Surfaces; Pages 21-22, Choosing the extrude style, i.e. extruding a plurality of curves from the input profile curve and path/guiding curve such that an NxM surface is generated/extruded having N profile curves and M guiding/path curves is understood to be generating N third curves and M fourth curves having an order no greater than the input profile and path curves from which they are being extruded).

Referring to claim 28, the rationale for claim 24 is incorporated herein, Maya Unlimited 2.0, as modified above, teaches the method of claim 24 but does not specifically teach processing the first curves and the second curve so that each one of the first curves and second curve are compatible with each other of first curves and the second curve.

Konno et al. teaches processing the first curves and the second curve so that each one of the first curves and second curve are compatible with each other of first curves and the second curve (Fig. 16; column 11, lines 57-65, i.e. it is understood that generating a curve mesh in which the various Gregory patches that correspond to the

various first curves are joined together at the second boundary curves is processing the first curves and second curve so that they are compatible with each other).

The rationale for combining Maya Unlimited 2.0 with the teachings of Konno et al. as found in the motivation statement of claim 24 is incorporated herein.

Referring to claim 29, the rationale for claim 24 is incorporated herein, Maya Unlimited 2.0, as modified above, teaches the method claim 24, but does not specifically teach modifying additional surfaces having the NxM surface condition to edit the drawing.

Konno et al. teaches further modifying additional surfaces having the NxM surface condition to edit the drawing (Fig. 16; column 11, lines 57-65, i.e. it is understood that generating a curve mesh in which the various Gregory patches that correspond to the various first curves are modified/joined together at the second boundary curves is modifying the additional surfaces having the NxM surface condition to edit the drawing).

The rationale for combining Maya Unlimited 2.0 with the teachings of Konno et al. as found in the motivation statement of claim 24 is incorporated herein.

Referring to claim 30, Maya Unlimited 2.0 teaches a method for interfacing with a surface within a computer-aided drawing environment, comprising:

using a computing system, determining that a first surface of a drawing comprises a first plurality of curves constituting a P x 1 surface condition, a P x 1 surface condition being defined by a number of first curves equal to P and only one second curve, wherein P is an integer greater than one (Pages 20-21, Extruding

Surfaces; Pages 21-22, Choosing the extrude style; Page 42, Creating birail surfaces; Pages 43-49, Using the Birail 1 Tool, i.e. it is understood that the profile curve is the second curve and the first curves P are the two rail curves that are connected to the profile curve such that the surface defined by the profile curve and rail curves is a surface having a P x 1 surface condition, wherein P is greater than one, see page 16, Installing Maya and Transition Guide for Maya IRIX Users; page 17, About This Book, i.e. it is understood that instructions for installing software and using the software with either the Windows NT operating system or IRIX indicates that the Maya software is installed in a computer system that is capable of executing the method steps as described);

in response to determining that the plurality of curves constitute a P x 1 surface condition and using the computing system, converting the P x 1 surface condition into an N x M surface condition by generating at least one auxiliary curve that is compatible with the number of first curves and the only one second curve that define the P x 1 surface condition, the N x M surface condition being defined by a number of third curves equal to N and a number of fourth curves equal to M, wherein N and M are integers greater than one (Pages 43-49, Using the Birail 1 Tool, i.e. the left hand figure on page 43 shows a 2x1 surface comprised of two rail/guiding curves and a single profile curve thus indicating a Px1 surface condition and the figures on the right and bottom show an NxM surface extruded from the 2x1 surface consisting of two rail/guiding curves and ten profile curves thus indicating that the Px1 surface condition is now an NxM surface condition), wherein each of the third and fourth curves are of the same mathematical

degree as the first and second curves to be compatible with the first and second curves; constructing an N x M surface under the N x M surface condition (Pages 43-49, Using the Birail 1 Tool, i.e. the left hand figure on page 43 shows a 2x1 surface comprised of two rail/guiding curves and a single profile curve thus indicating a Px1 surface condition and the figures on the right and bottom show an NxM surface extruded from the 2x1 surface consisting of two rail/guiding curves and ten profile curves thus indicating that the Px1 surface condition is now an NxM surface condition, and since NURBS surfaces are created by default (see page 44 and 48, Output Geometry) wherein the transform control allows the user to specify whether the profile curves swept along the rail curves are scaled proportionally or non-proportionally (see pages 44-45, Controlling the resulting transformation) then the third and fourth curves are understood to be mathematically filling the space of the surface plane defined by the profile and rail curves, see page 16, Installing Maya and Transition Guide for Maya IRIX Users; page 17, About This Book, i.e. it is understood that instructions for installing software and using the software with either the Windows NT operating system or IRIX indicates that the Maya software is installed in a computer system that is capable of executing the method steps as described); and

using the computing system, modifying the N x M surface to edit a drawing (Pages 28-30, Editing the extruded surface using manipulators, i.e. the extruded NxM surface may be edited by dragging the manipulators thus indicating that the NxM surface is being modified to edit the drawing, see page 16, Installing Maya and Transition Guide for Maya IRIX Users; page 17, About This Book, i.e. it is understood

that instructions for installing software and using the software with either the Windows NT operating system or IRIX indicates that the Maya software is installed in a computer system that is capable of executing the method steps as described).

Maya Unlimited 2.0 does not specifically teach generating at least one auxiliary curve that is substantially continuous with any adjoining surfaces of a surface having the P x 1 surface condition.

Konno et al. teaches generating at least one auxiliary curve that is substantially continuous with any adjoining surfaces of the first surface (Figs. 20-21; column 5, lines 20-29 and 35-48, i.e. the G^1 continuity of the boundary curve is checked at the endpoints and saved in memory and then used as the condition of continuity when generating auxiliary curves thereby ensuring that the auxiliary curve is continuous with any adjoining surfaces of the surface for which the auxiliary curve is generated).

The rationale for combining Maya Unlimited 2.0 with the teachings of Konno et al. as found in the motivation statement of claim 24 is incorporated herein.

Referring to claim 31, claim 31 recites all of the elements of claims 26 and 30 and therefore the rationale for the rejection of claims 26 and 30 are incorporated herein.

Referring to claim 32, claim 32 recites all of the elements of claims 27 and 30 and therefore the rationale for the rejection of claims 27 and 30 are incorporated herein.

Referring to claim 33, claim 33 recites all of the elements of claims 28 and 30 and therefore the rationale for the rejection of claims 28 and 30 are incorporated herein.

Referring to claim 34, claim 34 recites all of the elements of claims 29 and 30 and therefore the rationale for the rejection of claims 29 and 30 are incorporated herein.

Referring to claim 35, the rationale for claim 24 is incorporated herein, Maya Unlimited 2.0, as modified above, teaches all of the elements of claim 35 that is similar in scope to claim 24 above and further teaches a software program for performing the method of claim 24 using the IRIX or Windows NT operating systems (see page 16, Installing Maya and Transition Guide for Maya IRIX Users; page 17, About This Book, i.e. it is understood that instructions for installing software and using the software with either the Windows NT operating system or IRIX indicates that the Maya software is installed in a computer system running the operating systems described).

Maya Unlimited 2.0 does not specifically teach a software program stored on a computer readable medium and operable, when executed on a processor to perform the method as claimed.

Konno et al. teaches a computer-aided design (CAD) system and apparatus having a user interface, receiving means, processing means and memory means for receiving and processing curve mesh data to generate surfaces and storing said surfaces in memory (see Fig. 1; column 4, lines 39-62; column 13-14, lines 24-18).

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made that a computer aided drafting system capable of performing the method described would necessarily comprise a software program stored on a computer readable medium and operable, when executed on a processor, as part of a computer system having a display unit and an input device, to perform the methods of claim 24 as described above.

Referring to claim 36, claim 36 recites all of the elements of claims 25 and 35 and therefore the rationale for the rejection of claims 25 and 35 are incorporated herein.

Referring to claim 37, claim 37 recites all of the elements of claims 26 and 35 and therefore the rationale for the rejection of claims 26 and 35 are incorporated herein.

Referring to claim 38, claim 38 recites all of the elements of claims 27 and 35 and therefore the rationale for the rejection of claims 27 and 35 are incorporated herein.

Referring to claim 39, claim 39 recites all of the elements of claims 28 and 35 and therefore the rationale for the rejection of claims 28 and 35 are incorporated herein.

Referring to claim 40, claim 40 recites all of the elements of claims 29 and 35 and therefore the rationale for the rejection of claims 29 and 35 are incorporated herein.

Referring to claim 41, the rationale for claim 30 is incorporated herein, Maya Unlimited 2.0, as modified above, teaches all of the elements of claim 41 that is similar in scope to claim 30 above and further teaches a software program for performing the method of claim 30 using the IRIX or Windows NT operating systems (see page 16, Installing Maya and Transition Guide for Maya IRIX Users; page 17, About This Book, i.e. it is understood that instructions for installing software and using the software with either the Windows NT operating system or IRIX indicates that the Maya software is installed in a computer system running the operating systems described).

Maya Unlimited 2.0 does not specifically teach a system comprising a computer system having a display unit and an input device and a computer readable medium coupled to the computer system, the computer readable medium comprising a software program operable to perform the method as claimed.

Konno et al. teaches a computer-aided design (CAD) system and apparatus having a user interface, receiving means, processing means and memory means for receiving and processing curve mesh data to generate surfaces and storing said surfaces in memory (see Fig. 1; column 4, lines 39-62; column 13-14, lines 24-18, i.e. it is understood that a CAD system having a user interface, receiving means, processing means and memory means for receiving and processing curve mesh data to generate surfaces is descriptive of a computer system that includes a display unit for displaying the generated surfaces, an input device for interacting with the user interface, and a computer readable medium coupled to the computer system since these devices are inherent to any computer-aided design (CAD) system).

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made that a computer aided drafting system capable of performing the method described would necessarily comprise a computer system having a display unit and an input device; a computer readable medium coupled to the computer system, the computer readable medium comprising a software program operable to perform the method of claim 30 as described above.

Referring to claim 42, claim 42 recites all of the elements of claims 25 and 41 and therefore the rationale for the rejection of claims 25 and 41 are incorporated herein.

Referring to claim 43, claim 43 recites all of the elements of claims 26 and 41 and therefore the rationale for the rejection of claims 26 and 41 are incorporated herein.

Referring to claim 44, claim 44 recites all of the elements of claims 27 and 41 and therefore the rationale for the rejection of claims 27 and 41 are incorporated herein.

Referring to claim 45, claim 45 recites all of the elements of claims 28 and 41 and therefore the rationale for the rejection of claims 28 and 41 are incorporated herein.

Referring to claim 46, claim 46 recites all of the elements of claims 29 and 41 and therefore the rationale for the rejection of claims 29 and 41 are incorporated herein.

(10) Response to Argument

Appellant begins their arguments by stating that "As generally described in the specification, a computer-aided drafting (CAD) figure can include surfaces defined in various "surface condition" formats, according to the type and number of curves that describe the basic shape and boundaries of the surface. Some specific formats discussed herein include a Px1 surface condition (one or more curves in combination with a single other curve) and an NxM surface condition (two or more curves in combination with a two or more other curves). These formats are generally inconsistent with each other, and conventional systems imposed significant restrictions on each surface of a drawing based on the surface condition of the surface - some CAD modifications can only be performed on specific types of surfaces."

Examiner respectfully submits that nowhere in the specification, as originally filed, does the Appellant describe the "surface condition" format as being determined according to the type and number of curves that describe the **basic shape and boundaries (emphasis added)** of the surface. Instead, the specification discloses that the characteristics of a particular surface, such as its shape and orientation, are defined by curves and that the number of curves that define a surface identifies the method by which that surface is generated, see page 2, lines 11-22. The specification further

discloses that "A method for generating a surface is named based on the surface condition in which the surface was generated. A surface condition refers to the respective numbers of section curves and guidance curves that, in combination, may define a surface. In general, a surface condition is expressed in U x V format...", see page 9, lines 21-29. Thus, one of ordinary skill in the art at the time of invention would reasonably understand that defining a surface as having U x V curves is in effect defining/determining the "surface condition" of the defined surface since the "surface condition" is evidence of the method by which the surface is defined and generated.

Appellant first argues, with respect to claims 24 and 35, that "Maya is a user manual, and describes how a user might interact with a software application. It does not describe how or that the software itself manipulates any data—such as any curves, surface conditions, or surfaces – or performs any significant processing of the underlying data, such as the claimed conversion between surface conditions."

Examiner respectfully submits that Maya is a software drawing tool that defines surfaces using the same mathematics as curves except in UV coordinate space. The objects built in Maya may be modeled using NURBS surfaces. As admitted in Appellants specification, see page 10, lines 1-12, the adjustment of the mathematical formula of the NURBS curves so that the degree, knots and poles of the curves are uniform for all curves is known to one skilled in the art of drafting drawings using computers. Thus, one of ordinary skill in the art of drafting drawings would reasonably understand that the Maya software is manipulating the NURBS surfaces, curves and

surface conditions during the surface generation and editing processes described in the user manual.

Appellant next argues, with respect to claims 24 and 35, that nothing in the cited portions of Maya, nor in any other part of the cited art, teaches or suggests determining that a first surface of a drawing comprises a first plurality of curves comprising a P x 1 surface condition, a P x 1 surface condition being defined by a number of first curves equal to P and only one second curve, wherein P is an integer greater than zero, as required by claims 24 and 35.

Examiner respectfully submits that Appellant does not specifically disclose steps for determining the surface condition of a surface. Appellant merely discloses that the surface condition of a surface is expressed in U x V format, wherein the surface condition refers to the respective numbers of section curves and guide curves that, in combination, may define a surface and that the method used to generate a surface is also expressed in the U x V format and that the combination of two section curves and one guide curve, with or without the resulting surface, constitutes a 2X1 surface condition, see page 9, lines 21, through page 10, line 3. Thus, as defined in the specification, Maya teaches determining that a first surface of a drawing constitutes a Px1 surface condition when the surface is defined by P section curves and only 1 guiding curve, and determining that a second surface of a drawing comprises an NxM surface when the surface is defined by N section curves and M guiding curves, see Pages 20-21, Extruding Surfaces; Pages 21-22, Choosing the extrude style; Page 34, Adding curves to Lofted surfaces; Page 43, Using the Birail 1 Tool, i.e. once an NxM

surface has been generated via extrusion, lofting or the Birail Tools, it is understood that additional curves may be added/selected such that a first surface having a Px1 surface condition is determined. It is noted that Appellant does not specifically disclose how the determining step is performed and therefore any method of defining a surface in a U,V direction is sufficient to disclose such limitations. Thus, it would be obvious to one of ordinary skill at the time of invention to understand that defining a surface by a number of curves in the U x V coordinates is equivalent to determining the surface condition of the surface being defined such that a surface defined with a plurality of U first curves and a single V curve would constitute a U x 1 surface condition being determined.

Appellant then argues that Claim 35 specifically requires a software program stored on a computer readable medium and operable, when executed on a processor, to determine the P x 1 surface condition as argued above.

Examiner respectfully submits that the combination of primary reference Maya Unlimited 2.0 with secondary reference Konno et al. teaches all of the elements of claim 35 that is similar in scope to claim 24 above and further teaches a software program for performing the method of claim 24 using the IRIX or Windows NT operating systems (see page 16, Installing Maya and Transition Guide for Maya IRIX Users; page 17, About This Book, i.e. it is understood that instructions for installing software and using the software with either the Windows NT operating system or IRIX indicates that the Maya software is installed in a computer system running the operating systems described). Konno et al. teaches a computer-aided design (CAD) system and apparatus having a user interface, receiving means, processing means and memory means for

receiving and processing curve mesh data to generate surfaces and storing said surfaces in memory (see Fig. 1; column 4, lines 39-62; column 13-14, lines 24-18). Thus the combination of Maya 2.o and Konno et al. teaches all of the elements of claim 35 as indicated above.

Appellant next argues, with regards to claims 24 and 35, that nothing in Maya describes at all if any surface in the system is defined by any specific surface condition as that term is defined by the claim.

Examiner respectfully submits that the term "surface condition" is not defined in the claim, the claim limitation reads upon determining a surface having a P x 1 surface condition. The term is defined in the specification as being expressed in U x V format, wherein the surface condition refers to the respective numbers of section curves and guide curves that, in combination, may define a surface and that the method used to generate a surface is also expressed in the U x V format and that the combination of two section curves and one guide curve, with or without the resulting surface, constitutes a 2X1 surface condition, see page 9, lines 21, through page 10, line 3. Thus, as defined in the specification, one of ordinary skill in the art at the time of invention would reasonably understand that Maya 2.0 is a drawing application that defines surfaces in a U x V format wherein the user may determine the number of curves in U and V directions that define the NURBS surfaces from which objects may be built, see Chapter 5, pages 19-59 for a description of the various tools provided by Maya for the generation of surfaces. Since Appellant discloses in the background section of the specification that the method by which the surface is generated is defined by the

number of curves in the U and the V direction and that drawing packages impose modification restrictions on each surface based on the method used to generate the surface, see page 2, line 11 through page 3, line 3, then one of ordinary skill in the art at the time of invention would reasonably understand that the surface condition of each surface is determined by the drawing packages prior to the imposition of the modification restrictions since these restrictions cannot be placed without this knowledge. Appellant further describes the drawing application as a computer program that is operable to allow the user to draw, modify, edit, delete, or perform other drafting functions and provides an example of a drafting function that allows the user to input curves having any shape and orientation and then generating a surface defined by those curves such that the user may then join a plurality of these surfaces to form a drawing that has a desired shape, see page 7, lines 14-30. Thus, Examiner submits that the Maya 2.0 drawing application is an application that allows the user to perform all of the functions as defined in the specification.

Appellant then argues that "...Examiner continues that "it is understood that additional curves may be added/selected such that a first surface having a Px1 surface condition is determined." July 28, 2009 Office Action, page 3. This is not supported in the reference, nor are the other statements throughout the rejections that are prefaced with "it is understood'. These "understandings" are not common knowledge, nor supported by any evidence in the record. "It is understood" appears to refer to the Examiner's personal view as of 2009, and has nothing at all to do with the teachings of the references or what was known by those of skill in the art at the time of filing. This is

not proper support for any rejection. All such "it is understood" statements are traversed as not meeting any evidentiary requirement for a proper rejection of claims. If the Examiner is relying on personal knowledge to support the finding of what is known in the art, the Examiner was respectfully requested to provide an affidavit or declaration setting forth specific factual statements and explanation to support the finding, as required by 37 CFR 1.104(d)(2), but has declined to do so. In the Advisory Action, the Examiner states that the "it is understood" comments are intended "to indicate what one of ordinary skill in the art would reasonably conclude based on the disclosure of the cited references and based on Appellant' s own disclosure." October 5, 2009 Advisory Action. Appellant respectfully notes that the Examiner's statements of what "is understood" are not factually supported in, nor reasonably implied by, any teaching of the cited references."

Examiner respectfully submits that all such "it is understood" statements are intended to indicate what one of ordinary skill in the art at the time of invention would understand based on common knowledge in the art with regards to the cited references. For example, in the rejection of claim 24, the first determining step is rejected using the statement "...i.e. once an NxM surface has been generated via extrusion, lofting or the Birail Tools, it is understood that additional curves may be added/selected such that a first surface having a Px1 surface condition is determined...", this refers to the users ability to define and generate a first surface having a first number of curves in the U and V directions, and then to define and generate a second surface having a second number of curves in the U and V directions, whereby the user may define a first surface

with two or more curves in the U direction and two or more curves in the V direction and then define a second surface to be joined to the first surface, it is noted that Maya 2.0, page 20, Extruding surfaces indicates in the first paragraph that Extrude constructs a surface by moving a cross sectional profile curve along a path by sweeping and under the first subheading "To create an extruded surface:" the first paragraph states that you need at least two curves to create an extruded surface: a path curve and a profile curve, thus one of ordinary skill in the art at the time of invention would reasonable understand that a surface defined by the least number of required curves in a P x 1 surface with P equal to 1, in other words a 1 x 1 surface. This is given as an example in order to clarify Examiners intention with regards to the "it is understood" statements found in the rejection above. Examiner is not relying on personal knowledge to support the finding of what is known in the art but instead is relying on what is common knowledge at the time of invention as evidenced by Appellants own disclosure provided in the specification, see page 11, lines 14-21; page 15, lines 9-25 and 28-31; page 18, lines 1-12, i.e. the use of the term "conventional" with regards to the NURBS curves and the drawing packages indicates common knowledge of both the NURBS curves and the drawing packages at the time of invention, the further indication that one skilled in the art of drafting drawings using a computer would have knowledge of the mathematical process of adjusting the mathematical formulae of curves to have the same format is a further indication of common knowledge in the art at the time of invention as well as an indication of Appellants own awareness of what is common knowledge at the time of invention. Thus, it is understood by one of ordinary skill in the art at the time of invention

that the commonly known Maya 2.0 drawing application allows users to generate surfaces using a user specified number of curves in the U and V directions, wherein NURBS curves are the default, such that objects/drawings/models that are generated from the combination of multiple surfaces may be formed using surfaces that are generated using conventional drawing methods such as the P x 1 and N x M methods indicated in Appellants background information, these objects/drawings/models may also be edited, see pages 5-6 of the Maya reference mailed on 10/05/2009.

Appellant next argues that the Examiner is attempting to use the teachings of the instant application as part of a prior-art rejection and that this is improper because the Appellant has not described some teaching in the specification as "prior art". Appellant then indicates that Examiners response in the advisor action wherein the Examiner recites the portion of Appellants specification wherein the determination of the P x 1 or N x M surface condition is based on the number of section curves and guide curves and then states that "...as defined in the specification, Maya teaches determining that a first surface of a drawing constitutes a P x 1 surface condition when the surface is defined by P section curves and only one guide curve..." is an attempt to improperly impute teachings of the instant application into the Maya reference, see Brief pages 27, line 8, through page 28, line 3.

Examiner respectfully submits that Appellant has not defined an explicit method for performing the determination of the surface condition. However, Appellant has provided teachings in the BACKGROUND OF THE INVENTION section of the specification that the characteristics of a particular surface, such as its shape and

orientation, are defined by curves and that a curve is defined by a graph of a mathematical function. The section further teaches that because a surface is defined by the curves, it is modified by adjusting, adding, or deleting the curves and that the number of curves that define a surface identifies the method by which that surface is generated. Appellant further teaches in this section that drawing packages impose modification restrictions on each surface based on the method that was used to generate the surface and also impose modification restrictions on each curve based on the mathematical equation that defines the curve and because of these restrictions, a user must keep track of the method that was used to generate each surface that the user wants to modify and the user must also keep track of the mathematical characteristics of each curve that the user wants to modify thus making it inconvenient and inefficient for the user to modify or edit a drawing, see pages 2-3 of Appellants specification as originally filed. Thus Appellant implicitly teaches that the drawing packages themselves are determining the surface condition for each surface of the drawing since this knowledge is required in order to impose the modification restrictions and the user must necessarily keep track of the method/surface condition of each surface because of the restrictions imposed by the drawing application. While the Appellant has not explicitly indicated that the disclosure in the BACKGROUND OF THE INVENTION section of the specification is "prior art" per se, one of ordinary skill in the art at the time of invention would recognize the disclosure in this section as indicative of common knowledge in the art at the time of invention particularly when one considers the statement of the problem to be solved found on page 4, lines 19-28 of Appellants

specification. It is noted that Examiner is referring to sections of Appellants specification in order to clarify the Examiner's interpretation of the claim limitations and how they may be rejected by the cited art in order to increase Appellants understanding of the rejection and the cited art that has been applied.

Appellant then repeats the portion of the disclosure found on page 9, line 10, through page 10, line 3, of the specification as indicating that the "surface condition" refers to the number of section curves and guide curves that, in combination, may define a surface and that the Examiner appears to attempt to simply show a number of curves, and therefore assert that these are a surface condition as described in the specification.

Examiner respectfully submits that the cited portion of the specification indicates that the "surface condition" and the method used for generating a surface are both expressed in identical UxV format thus indicating that the U curves and the V curves used to generate the surface are the section and guide curves of the resulting surface. Thus expressing the method used for generating a surface expresses the "surface condition" of the surface generated and thus the "surface condition" is determined at the time that the method is defined. Examiner further submits that Maya 2.0, page 20, Extruding surfaces indicates, in the first paragraph, that the Extrude method constructs a surface by moving a cross sectional profile curve along a path by sweeping and under the first subheading "To create an extruded surface:" the first paragraph states that you need at least two curves to create an extruded surface: a path curve and a profile curve, thus one of ordinary skill in the art at the time of invention would reasonable understand

that a surface defined by the least number of required curves in a P x 1 surface with P equal to 1, in other words a 1 x 1 surface thus indicating both the method and "surface condition" of the surface being generated.

Appellant then argues that the "...Examiner has made no showing at all that any surface is determined to comprise specific curves or surface conditions. The portions and figures indicated by the Examiner primarily concern adding curves to a wireframe (perhaps so a later surface could be generated), but not examining the surface conditions that define a given surface. "

Examiner respectfully submits that Appellant has not explicitly defined how the "surface condition" is to be determined other than to indicate that the "surface condition" is determined based on the method by which the surface is generated and that both the method and the "surface condition" are identically expressed in the UxV format. Thus, one of ordinary skill in the art at the time of invention would reasonably conclude that any drawing application that defines a surface by the method by which it is generated is in effect defining the surface by its "surface condition", see Maya 2.0, page 20, Extruding surfaces indicates, in the first paragraph, that the Extrude method constructs a surface by moving a cross sectional profile curve along a path by sweeping and under the first subheading "To create an extruded surface:" the first paragraph states that you need at least two curves to create an extruded surface: a path curve and a profile curve, thus one of ordinary skill in the art at the time of invention would reasonable understand that a surface defined by the least number of required curves in a P x 1 surface with P

equal to 1, in other words a 1 x 1 surface thus indicating both the method and "surface condition" of the surface being generated.

Appellant then argues that "Since none of the cited references are concerned with identifying the various surface conditions that define the surfaces of a drawing, so that one or more of the surfaces can be replaced with surfaces having uniform surface conditions, it is clear that none of the references would address this specific limitation."

In response to Appellant's argument that the references fail to show certain features of Appellant's invention, it is noted that the features upon which Appellant relies (i.e., identifying the various surface conditions that define the surfaces of a drawing, so that one or more of the surfaces can be replaced with surfaces having uniform surface conditions, Appeal Brief, page 29, lines 11-14) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Examiner respectfully submits that Maya 2.0, page 20, Extruding surfaces indicates, in the first paragraph, that the Extrude method constructs a surface by moving a cross sectional profile curve along a path by sweeping and under the first subheading "To create an extruded surface:" the first paragraph states that you need at least two curves to create an extruded surface: a path curve and a profile curve, thus one of ordinary skill in the art at the time of invention would reasonable understand that a surface defined by the least number of required curves in a P x 1 surface with P equal to 1, in other words a 1 x 1 surface thus indicating both the method and "surface

condition" of the surface being generated. Konno et al. teaches that the G^1 continuity of the boundary curve is checked at the endpoints and saved in memory and then used as the condition of continuity when generating auxiliary curves thereby ensuring that the auxiliary curve is continuous with any adjoining surfaces of the surface for which the auxiliary curve is generated thus indicating that a first NxM surface generated adjacent to a second NxM surface would have a NxM surface condition to match the second NxM surface condition of the second surface in order to ensure continuity between the adjacent surfaces, see Figs. 20-21; column 5, lines 20-29 and 35-48. Thus the combination of primary reference Maya 2.0 with secondary reference Konno et al. teaches all of the elements of claims 24 and 35 as they are currently claimed.

Appellant then argues, with respect to claim 24, that "...Maya does not describe, at all, how any surface is defined by the system, whether by a Px1 surface condition, or an NxM surface condition, or otherwise. There is simply no such teaching, nor would there be in a user manual. As none of this information is described, there can be no implication that adding additional curves would determine any new surface having a specific surface condition."

Examiner respectfully submits that Maya 2.0, page 20, Extruding surfaces indicates, in the first paragraph, that the Extrude method constructs a surface by moving a cross sectional profile curve along a path by sweeping and under the first subheading "To create an extruded surface:" the first paragraph states that you need at least two curves to create an extruded surface: a path curve and a profile curve, thus one of ordinary skill in the art at the time of invention would reasonable understand that a

surface defined by the least number of required curves in a P x 1 surface with P equal to 1, in other words a 1 x 1 surface thus indicating both the method and "surface condition" of the surface being generated. Konno et al. teaches that the G^1 continuity of the boundary curve is checked at the endpoints and saved in memory and then used as the condition of continuity when generating auxiliary curves thereby ensuring that the auxiliary curve is continuous with any adjoining surfaces of the surface for which the auxiliary curve is generated thus indicating that a first NxM surface generated adjacent to a second NxM surface would have a NxM surface condition to match the second NxM surface condition of the second surface in order to ensure continuity between the adjacent surfaces, see Figs. 20-21; column 5, lines 20-29 and 35-48. Since Maya 2.0 teaches a method of generating a surface using at least one profile curve and one path curve and since Appellant has indicated that the method for generating a surface defines the "surface condition" and is expressed identically, see Examiners response above, since Appellant has not disclosed how the determinations are made then one must conclude that any determination or definition of a surface based on the method by which the surface is generated is sufficient to determine the "surface condition" as currently claimed. Thus, the combination of primary reference Maya 2.0 with secondary reference Konno et al. teaches all of the elements of claims 24 and 35 as they are currently claimed.

Appellant then argues, with respect to claim 24, that "the Examiner again fails to address the actual claim limitation. The claim does not require that curves are added until a surface is defined, the claim requires that the system determines what kind of

surface it is. The claim requires that the system determines that the second surface comprises curves constituting an NxM surface condition. Nothing in Maya teaches anything about determining the surface condition for a given surface."

Examiner respectfully submits that Appellant defines the type of surface by the method used to generate the surface, see pages 2-3 and 9, line 10 through page 10, line 3. Since Maya uses specific methods (e.g. Extrusion, Birail, Lofting methods are described) to generate the surfaces, see the response provided above, then Maya is in effect determining the "surface condition" and since Appellant has not disclosed how the determinations are made then one must conclude that any determination or definition of a surface based on the method by which the surface is generated is sufficient to determine the "surface condition" as currently claimed and described in the specification.

Appellant next argues, with respect to claim 24, that "The Examiner's rejection states "Page 34, Adding curves to Lofted surfaces; Page 43, Using the Birail 1 Tool, i.e. curves are added adjacent to an NxM lofted surface such that a Px1 surface condition is identified and then an NxM surface is generated adjacent to the existing NxM surface .... " July 28, 2009 Office Action, page 4. This is completely unsupported in the cited references. The pages to which the Examiner refers are reproduced above, and it is clear that no surfaces are taught or suggested to be maintained by the system as surfaces defined by NxM surface conditions, no surfaces are taught or suggested to be maintained by the system as surfaces defined by Px1 surface conditions, and there

is absolutely no teaching or suggestion that any Px1 surface conditions are converted to NxM surface conditions, as claimed."

Examiner respectfully submits that Appellants specification teaches wherein a surface is determined to be a Px1 surface or an NxM surface based on the number of section curves and guide curves that, in combination, may define a surface, see pages 9-10, lines 21-3. Thus, as defined in the specification, Maya teaches determining that a first surface of a drawing constitutes a Px1 surface condition when the surface is defined by P section curves and only 1 guiding curve, and determining that a second surface of a drawing comprises an NxM surface when the surface is defined by N section curves and M guiding curves, see Pages 20-21, Extruding Surfaces; Pages 21-22, Choosing the extrude style; Page 34, Adding curves to Lofted surfaces; Page 43, Using the Birail 1 Tool, i.e. once an NxM surface has been generated via extrusion, lofting or the Birail Tools, it is understood that additional curves may be added/selected such that a first surface having a Px1 surface condition is determined. It is noted that Appellant does not specifically disclose how the determining step is to be performed and therefore any method of defining a surface in a U,V direction is sufficient to disclose such limitations.

Appellant then argues, with respect to claim 24, that "Konno discusses surface-matching techniques, but does not at any time teach or suggest the surface conditions as defined by the instant claims. Konno does not consider at all different surfaces with different surface conditions. Konno certainly does not convert between one surface condition, as defined by the claims, into another surface condition. There

simply is no relevant teaching. Appellant does not address the Examiner's characterization of Konno's continuity checking in Fig. 5, but it is clear that the further characterization of what is "thus indicated" is completely factually incorrect."

Examiner respectfully submits that Konno et al. teaches generating at least one auxiliary curve that is substantially continuous with any adjoining surfaces of the first surface, Figs. 20-21; column 5, lines 20-29 and 35-48, i.e. the G1 continuity of the boundary curve is checked at the endpoints and saved in memory and then used as the condition of continuity when generating auxiliary curves thereby ensuring that the auxiliary curve is continuous with any adjoining surfaces of the surface for which the auxiliary curve is generated. Appellant teaches wherein the surface condition of a first surface is an NXM surface when the edges/curves that define the boundaries of the surface in a first direction (i.e. North/South) have matching control points connecting the edges/curves of the opposing direction (i.e. East/West) while a second connected surface may be bordered by an edge/curve with control points directed to the curves of the neighboring surface and thus not belonging to that surface's surface condition (i.e. not continuous), see figure 2D and page 14, lines 8-31. One of ordinary skill in the art at the time of invention would recognise that adding auxilliary curves to a surface such that the curves are continuous with an adjacent surface, as taught in Konno, indicates the conversion of the surface condition of a first surface to the surface condition of the second surface. Therefore the combination of primary reference Maya 2.0 with secondary reference Konno et al. teaches all of the claim limitations of claim 24 as indicated above.

Appellant then argues that "...Examiner does not specifically address this limitation at all, but it is clear that nothing in the cited references teaches or suggests constructing any surface under any specific surface condition, and certainly not constructing on (sic) under an NxM surface condition that is converted from a Px1 surface condition."

Examiner respectfully submits that Appellant discloses in the specification, page 20, line 26, through page 21, line 6, that a **P x 1 surface condition** (emphasis added) is converted to an **NxM surface condition** (emphasis added) by creating one or more auxiliary curves for any surface having a Px1 surface condition. Appellant further discloses that the conversion of the Px1 surface condition to the NxM surface condition may be obtained by sweeping the section curve along the guide curve or by sweeping the guide curve along the section curve by mathematically extrapolating a curve along another intersecting curve so that the extrapolation creates the appearance of a continuous surface and may be performed using any appropriate mathematical algorithm, see page 21, lines 15-29. Thus, as disclosed in Appellants specification, one of ordinary skill in the art at the time of invention would understand that the combination of Maya 2.0 wherein surfaces are generated using a sweep of a first curve along an intersecting curve such that a Px1 surface condition is converted to an NxM surface condition during the generation of a NxM surface from an initial Px1 surface is equivalent to what is disclosed in the specification, see Maya 2.0, page 43-49, and Konno et al. wherein at least one auxiliary curve is generated that is substantially continuous with any adjoining surfaces of the first surface, Figs. 20-21; column 5, lines

20-29 and 35-48, i.e. the G1 continuity of the boundary curve is checked at the endpoints and saved in memory and then used as the condition of continuity when generating auxiliary curves thereby ensuring that the auxiliary curve is continuous with any adjoining surfaces of the surface for which the auxiliary curve is generated teaches all of the claim limitations of claims 24 and 35 as indicated above.

Appellant then argues, with respect to claim 24, that the cited references allow a drawing to be edited but that they do not teach editing an NxM surface constructed under an NxM surface condition that was converted from a Px1 surface condition.

Examiner respectfully submits that, as admitted by the Appellant, see argument above, Maya 2.0 allow drawings to be edited, since the specification teaches that the Px1 surface may be converted to an NxM surface by creating one or more auxiliary curves for any surface having a Px1 surface condition in the manner indicated above, see specification, page 21, lines 15-29, then one of ordinary skill would recognize that Maya 2.0 teaches wherein surfaces are generated using a sweep of a first curve along an intersecting curve such that a Px1 surface condition is converted to an NxM surface condition during the generation of a NxM surface from an initial Px1 surface, see Maya 2.0, page 43-49, and therefore any subsequent editing of surfaces would be understood by one of ordinary skill in the art at the time of invention to be editing an NxM surface constructed under an NxM surface condition as claimed.

Appellant next argues, with regards to claims 25 and 36, that "...nothing in any combination of the cited references teaches or suggests the claimed NxM or Px1 surface conditions at all. They certainly don't teach or suggest converting the Px1

surface condition into the NxM surface condition, nor that it should be compatible with a specific curve that defines the Px1 surface condition. The Examiner refers again to portions of Maya and Konno discussed above, but it is clear that they include no teaching, suggestion, or implication regarding the claimed surface conditions."

Examiner respectfully submits that Appellant discloses in the specification, page 20, line 26, through page 21, line 6, that a **P x 1 surface condition** (emphasis added) is converted to an **NxM surface condition** (emphasis added) by creating one or more auxiliary curves for any surface having a Px1 surface condition. Appellant further discloses that the conversion of the Px1 surface condition to the NxM surface condition may be obtained by sweeping the section curve along the guide curve or by sweeping the guide curve along the section curve by mathematically extrapolating a curve along another intersecting curve so that the extrapolation creates the appearance of a continuous surface and may be performed using any appropriate mathematical algorithm, see page 21, lines 15-29.

Maya 2.0, page 20, Extruding surfaces section teaches, in the first paragraph, that the Extrude method constructs a surface by moving a cross sectional profile curve along a path by sweeping and under the first subheading "To create an extruded surface:" the first paragraph states that you need at least two curves to create an extruded surface: a path curve and a profile curve, thus it would be reasonable for one of ordinary skill in the art at the time of invention to understand that a surface defined by the least number of required curves in a P x 1 surface with P equal to 1, in other words a 1 x 1 surface thus indicating both the method and "surface condition" of the surface

being generated wherein the surface is then swept to extrapolate profile curves along a path curve is teaching the conversion of a surface condition as claimed. Konno et al. teaches that the G^1 continuity of the boundary curve is checked at the endpoints and saved in memory and then used as the condition of continuity when generating auxiliary curves thereby ensuring that the auxiliary curve is continuous with any adjoining surfaces of the surface for which the auxiliary curve is generated thus indicating that a first NxM surface generated adjacent to a second NxM surface would have a NxM surface condition to match the second NxM surface condition of the second surface in order to ensure continuity between the adjacent surfaces, see Figs. 20-21; column 5, lines 20-29 and 35-48. Since Maya 2.0 teaches a method of generating a surface using at least one profile curve and one path curve and since Appellant has indicated that the method for generating a surface defines the "surface condition" and is expressed identically, see Examiners response above, and since Appellant has not disclosed how the determination steps are performed then one must conclude that any determination or definition of a surface based on the method by which the surface is generated is sufficient to determine the "surface condition" as currently claimed. Konno et al. teaches generating at least one auxiliary curve that is substantially continuous with any adjoining surfaces of the first surface, Figs. 20-21; column 5, lines 20-29 and 35-48, i.e. the G1 continuity of the boundary curve is checked at the endpoints and saved in memory and then used as the condition of continuity when generating auxiliary curves thereby ensuring that the auxiliary curve is continuous with any adjoining surfaces of the surface for which the auxiliary curve is generated. Therefore the combination of primary

reference Maya 2.0 with secondary reference Konno et al. teaches all of the claim limitations of claims 25 and 36 as indicated above.

Appellant next argues, with regards to claims 26 and 37, that "...nothing in any combination of the cited references teaches or suggests the claimed NxM or Px1 surface conditions at all. They certainly don't teach or suggest replacing the Px1 surface condition with the NxM surface condition that was converted from it. The Examiner refers again to portions of Maya and Konno discussed above, but it is clear that they include no teaching, suggestion, or implication regarding the claimed surface conditions."

Examiner respectfully submits that Appellant discloses in the specification, page 20, line 26, through page 21, line 6, that a **P x 1 surface condition** (emphasis added) is converted to an **NxM surface condition** (emphasis added) by creating one or more auxiliary curves for any surface having a Px1 surface condition. Appellant further discloses that the conversion of the Px1 surface condition to the NxM surface condition may be obtained by sweeping the section curve along the guide curve or by sweeping the guide curve along the section curve by mathematically extrapolating a curve along another intersecting curve so that the extrapolation creates the appearance of a continuous surface and may be performed using any appropriate mathematical algorithm, see page 21, lines 15-29. Thus, as disclosed in Appellants specification, one of ordinary skill in the art at the time of invention would understand that the combination of Maya 2.0 wherein surfaces are generated using a sweep of a first curve along an intersecting curve such that a Px1 surface condition is converted to an NxM surface

condition during the generation of a NxM surface from an initial Px1 surface is equivalent to what is disclosed in the specification, see Maya 2.0, page 43-49, teaches replacing a Px1 surface condition with an NxM surface condition as claimed.

Appellant next argues, with regards to claims 27 and 38, that "...nothing in any combination of the cited references teaches or suggests the claimed NxM or Px1 surface conditions at all. They certainly don't teach or suggest the specific way to produce the NxM surface condition from the converted Px1 surface condition, as in these claims. The Examiner refers again to portions of Maya reproduced above, but it is clear that they include no teaching, suggestion, or implication regarding the claimed surface conditions."

Examiner respectfully submits that Appellant discloses in the specification, page 20, line 26, through page 21, line 6, that a **P x 1 surface condition** (emphasis added) is converted to an **NxM surface condition** (emphasis added) by creating one or more auxiliary curves for any surface having a Px1 surface condition. Appellant further discloses that the conversion of the Px1 surface condition to the NxM surface condition may be obtained by sweeping the section curve along the guide curve or by sweeping the guide curve along the section curve by mathematically extrapolating a curve along another intersecting curve so that the extrapolation creates the appearance of a continuous surface and may be performed using any appropriate mathematical algorithm, see page 21, lines 15-29.

Maya 2.0, page 20, Extruding surfaces section teaches, in the first paragraph, that the Extrude method constructs a surface by moving a cross sectional profile curve

along a path by sweeping and under the first subheading "To create an extruded surface:" the first paragraph states that you need at least two curves to create an extruded surface: a path curve and a profile curve, thus it would be reasonable for one of ordinary skill in the art at the time of invention to understand that a surface defined by the least number of required curves in a P x 1 surface with P equal to 1, in other words a 1 x 1 surface thus indicating both the method and "surface condition" of the surface being generated wherein the surface is then swept to extrapolate profile curves along a path curve is teaching the conversion of a surface condition as claimed. Konno et al. teaches that the G^1 continuity of the boundary curve is checked at the endpoints and saved in memory and then used as the condition of continuity when generating auxiliary curves thereby ensuring that the auxiliary curve is continuous with any adjoining surfaces of the surface for which the auxiliary curve is generated thus indicating that a first NxM surface generated adjacent to a second NxM surface would have a NxM surface condition to match the second NxM surface condition of the second surface in order to ensure continuity between the adjacent surfaces, see Figs. 20-21; column 5, lines 20-29 and 35-48. Since Maya 2.0 teaches a method of generating a surface using at least one profile curve and one path curve and since Appellant has indicated that the method for generating a surface defines the "surface condition" and is expressed identically, see Examiners response above, and since Appellant has not disclosed how the determination steps are performed then one must conclude that any determination or definition of a surface based on the method by which the surface is generated is sufficient to determine the "surface condition" as currently claimed. Konno et al. teaches

generating at least one auxiliary curve that is substantially continuous with any adjoining surfaces of the first surface, Figs. 20-21; column 5, lines 20-29 and 35-48, i.e. the G1 continuity of the boundary curve is checked at the endpoints and saved in memory and then used as the condition of continuity when generating auxiliary curves thereby ensuring that the auxiliary curve is continuous with any adjoining surfaces of the surface for which the auxiliary curve is generated. Therefore the combination of primary reference Maya 2.0 with secondary reference Konno et al. teaches all of the claim limitations of claims 27 and 38 as indicated above.

Appellant next argues, with regards to claims 28 and 39, that "...nothing in any combination of the cited references teaches or suggests the claimed NxM or Px1 surface conditions at all. They certainly don't teach or suggest this specific processing of each of the P first curves and the single second curve. The Examiner refers to Konno at col. 11, lines 57-65 and Fig. 16, but it is clear that they include no teaching, suggestion, or implication regarding the claimed surface conditions."

Examiner respectfully submits that Appellant discloses in the specification, page 20, line 26, through page 21, line 6, that a **P x 1 surface condition** (emphasis added) is converted to an **NxM surface condition** (emphasis added) by creating one or more auxiliary curves for any surface having a Px1 surface condition. Appellant further discloses that the conversion of the Px1 surface condition to the NxM surface condition may be obtained by sweeping the section curve along the guide curve or by sweeping the guide curve along the section curve by mathematically extrapolating a curve along another intersecting curve so that the extrapolation creates the appearance of a

continuous surface and may be performed using any appropriate mathematical algorithm, see page 21, lines 15-29. Konno is not depended upon to teach surfaces having specific surface conditions, Maya 2.0 is depended upon for the teaching of surfaces and surface conditions as they are defined in Appellants specification and Konno is depended upon to teach generating auxiliary curves that are continuous with curves on adjacent surfaces.

Maya 2.0, page 20, Extruding surfaces section teaches, in the first paragraph, that the Extrude method constructs a surface by moving a cross sectional profile curve along a path by sweeping and under the first subheading "To create an extruded surface:" the first paragraph states that you need at least two curves to create an extruded surface: a path curve and a profile curve, thus it would be reasonable for one of ordinary skill in the art at the time of invention to understand that a surface defined by the least number of required curves in a P x 1 surface with P equal to 1, in other words a 1 x 1 surface thus indicating both the method and "surface condition" of the surface being generated wherein the surface is then swept to extrapolate profile curves along a path curve is teaching the conversion of a surface condition as claimed. Konno et al. teaches that the G^1 continuity of the boundary curve is checked at the endpoints and saved in memory and then used as the condition of continuity when generating auxiliary curves thereby ensuring that the auxiliary curve is continuous with any adjoining surfaces of the surface for which the auxiliary curve is generated thus indicating that a first NxM surface generated adjacent to a second NxM surface would have a NxM surface condition to match the second NxM surface condition of the second surface in

order to ensure continuity between the adjacent surfaces, see Figs. 20-21; column 5, lines 20-29 and 35-48. Since Maya 2.0 teaches a method of generating a surface using at least one profile curve and one path curve and since Appellant has indicated that the method for generating a surface defines the "surface condition" and is expressed identically, see Examiners response above, and since Appellant has not disclosed how the determination steps are performed then one must conclude that any determination or definition of a surface based on the method by which the surface is generated is sufficient to determine the "surface condition" as currently claimed. Konno et al. teaches generating at least one auxiliary curve that is substantially continuous with any adjoining surfaces of the first surface, Figs. 20-21; column 5, lines 20-29 and 35-48, i.e. the G1 continuity of the boundary curve is checked at the endpoints and saved in memory and then used as the condition of continuity when generating auxiliary curves thereby ensuring that the auxiliary curve is continuous with any adjoining surfaces of the surface for which the auxiliary curve is generated thus indicating that each one of the first curves and second curve are compatible with each other of the first curves and second curve as claimed. Therefore the combination of primary reference Maya 2.0 with secondary reference Konno et al. teaches all of the claim limitations of claims 28 and 39 as indicated above.

Appellant next argues, with regards to claims 29 and 40, that "...nothing in any combination of the cited references teaches or suggests the claimed NxM or Px1 surface conditions at all. They certainly don't teach or suggest modifying additional surfaces having a specific NxM surface condition, as claimed. The Examiner refers

again to portions of Konno discussed above with relation to claim 28, but it is clear that Konno includes no teaching, suggestion, or implication regarding the claimed surface conditions. In fact, the Examiner appears to contradict herself by relying on Konno's Fig. 16 for both the claims Px1 surface condition and the claimed NxM surface condition."

Examiner respectfully submits that the Maya Unlimited 2.0 reference is not merely an extrusion method for generating surfaces but a system and method for creating and editing surfaces and thus is not merely limited to surface generation but also to subsequent editing of the surfaces generated, see pages 28-31, Editing the extruded surface in the Attribute Editor; pages 39-41, Editing part of a lofted surface; pages 48-51, Editing the single birail in the Attribute Editor; pages 52-53, Editing the double birail in the Attribute Editor; and pages 57-59, Editing the multi birail surface in the Attribute Editor. Konno et al. teaches generating auxiliary curves that are substantially continuous with any adjoining surfaces of a surface, see Figs. 20-21; column 5, lines 20-29 and 35-48. Thus, it would be reasonable for one of ordinary skill in the art at the time of invention to understand that since all surfaces of an object may be individually edited/modified in Maya 2.0 then surfaces of additional NxM surfaces that have the first NxM surface condition of the second surface may be modified/edited as claimed.

Appellant next argues, with regards to claims 30 and 41, that "Except for one figure under "To add additional curves to a lofted surface", none of the figures cited by the Examiner show a surface at all, and there can be no teaching that any surface is determined to comprise any curves constituting any surface condition. Certainly, nothing

in Maya describes at all if any surface in the system is defined by any specific surface condition. The Examiner merely refers to various of Maya's figures and assumes that some curves may be used to define some (unseen) surfaces, but does not show any teaching in Maya that any surface comprise any curves that constitute a specific surface condition."

Examiner respectfully submits that Appellant does not specifically disclose steps for determining the surface condition of a surface. Appellant merely discloses that the surface condition of a surface is expressed in U x V format, wherein the surface condition refers to the respective numbers of section curves and guide curves that, in combination, may define a surface and that the method used to generate a surface is also expressed in the U x V format and that the combination of two section curves and one guide curve, with or without the resulting surface, constitutes a 2X1 surface condition, see page 9, lines 21, through page 10, line 3. Thus, as defined in the specification, Maya teaches determining that a first surface of a drawing constitutes a Px1 surface condition when the surface is defined by P section curves and only 1 guiding curve, and determining that a second surface of a drawing comprises an NxM surface when the surface is defined by N section curves and M guiding curves, see Pages 20-21, Extruding Surfaces; Pages 21-22, Choosing the extrude style; Page 34, Adding curves to Lofted surfaces; Page 43, Using the Birail 1 Tool, i.e. once an NxM surface has been generated via extrusion, lofting or the Birail Tools, it is understood that additional curves may be added/selected such that a first surface having a Px1 surface condition is determined. It is noted that Appellant does not specifically disclose how the

determining step is performed and therefore any method of defining a surface in a U,V direction is sufficient to disclose such limitations. Thus, it would be obvious to one of ordinary skill at the time of invention to understand that defining a surface by a number of curves in the U x V coordinates is equivalent to determining the surface condition of the surface being defined such that a surface defined with a plurality of U first curves and a single V curve would constitute a U x 1 surface condition being determined.

Appellant next argues, with regards to claims 30 and 41, that nothing in Maya describes at all if any surface in the system is defined by any specific surface condition as that term is defined by the claim.

Examiner respectfully submits that the term "surface condition" is not defined in the claim, the claim limitation reads upon determining a surface having a P x 1 surface condition. The term is defined in the specification as being expressed in U x V format, wherein the surface condition refers to the respective numbers of section curves and guide curves that, in combination, may define a surface and that the method used to generate a surface is also expressed in the U x V format and that the combination of two section curves and one guide curve, with or without the resulting surface, constitutes a 2X1 surface condition, see page 9, lines 21, through page 10, line 3. Thus, as defined in the specification, one of ordinary skill in the art at the time of invention would reasonably understand that Maya 2.0 is a drawing application that defines surfaces in a U x V format wherein the user may determine the number of curves in U and V directions that define the NURBS surfaces from which objects may be built, see Chapter 5, pages 19-59 for a description of the various tools provided by Maya for the

generation of surfaces. It is noted that pages 43-44, Using the Birail 1 Tool explicitly teaches a surface generation method using two rail curves and one profile curve wherein the profile curve is swept along the two rail curves thus indicating a 2x1 surface generation method that is indicative of a 2x1 surface condition wherein P=2 and thus is greater than one as claimed in claims 30 and 41. Since Appellant discloses in the background section of the specification that the method by which the surface is generated is defined by the number of curves in the U and the V direction and that drawing packages impose modification restrictions on each surface based on the method used to generate the surface, see page 2, line 11 through page 3, line 3, then one of ordinary skill in the art at the time of invention would reasonably understand that the surface condition of each surface is determined by the drawing packages prior to the imposition of the modification restrictions since these restrictions cannot be placed without this knowledge. Appellant further describes the drawing application as a computer program that is operable to allow the user to draw, modify, edit, delete, or perform other drafting functions and provides an example of a drafting function that allows the user to input curves having any shape and orientation and then generating a surface defined by those curves such that the user may then join a plurality of these surfaces to form a drawing that has a desired shape, see page 7, lines 14-30. Konno et al. teaches generating at least one auxiliary curve that is substantially continuous with any adjoining surfaces of the first surface (Figs. 20-21; column 5, lines 20-29 and 35-48, i.e. the G^1 continuity of the boundary curve is checked at the endpoints and saved in memory and then used as the condition of continuity when generating auxiliary curves

thereby ensuring that the auxiliary curve is continuous with any adjoining surfaces of the surface for which the auxiliary curve is generated). Therefore the combination of primary reference Maya 2.0 with secondary reference Konno et al. teaches all of the claim limitations of claims 30 and 41 as indicated above.

Appellant then argues, with respect to claims 30 and 41, that the "...Examiner has made no showing at all that any surface is determined to comprise specific curves or surface conditions. The portions and figures indicated by the Examiner primarily concern adding curves to a wireframe (perhaps so a later surface could be generated), but not examining the surface conditions that define a given surface. "

Examiner respectfully submits that Appellant has not explicitly defined how the "surface condition" is to be determined other than to indicate that the "surface condition" is determined based on the method by which the surface is generated and that both the method and the "surface condition" are identically expressed in the UxV format. Thus, one of ordinary skill in the art at the time of invention would reasonably conclude that any drawing application that defines a surface by the method by which it is generated is in effect defining the surface by its "surface condition", see Maya 2.0, page 20, Extruding surfaces, indicates, in the first paragraph, that the Extrude method constructs a surface by moving a cross sectional profile curve along a path by sweeping and under the first subheading "To create an extruded surface:" the first paragraph states that you need at least two curves to create an extruded surface: a path curve and a profile curve, thus one of ordinary skill in the art at the time of invention would reasonable understand

that a surface defined by the least number of required curves in a P x 1 surface with P equal to 1, in other words a 1 x 1 surface thus indicating both the method and "surface condition" of the surface being generated.

Appellant then argues, with respect to claims 30 and 41, that "Since none of the cited references are concerned with identifying the various surface conditions that define the surfaces of a drawing, so that one or more of the surfaces can be replaced with surfaces having uniform surface conditions, it is clear that none of the references would address this specific limitation."

In response to Appellant's argument that the references fail to show certain features of Appellant's invention, it is noted that the features upon which Appellant relies (i.e., identifying the various surface conditions that define the surfaces of a drawing, so that one or more of the surfaces can be replaced with surfaces having uniform surface conditions, Appeal Brief, page 41, lines 5-8) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Examiner respectfully submits that Maya 2.0, page 20, Extruding surfaces indicates, in the first paragraph, that the Extrude method constructs a surface by moving a cross sectional profile curve along a path by sweeping and under the first subheading "To create an extruded surface:" the first paragraph states that you need at least two curves to create an extruded surface: a path curve and a profile curve, thus one of ordinary skill in the art at the time of invention would reasonable understand that a

surface defined by the least number of required curves in a P x 1 surface with P equal to 1, in other words a 1 x 1 surface thus indicating both the method and "surface condition" of the surface being generated. Konno et al. teaches that the G^1 continuity of the boundary curve is checked at the endpoints and saved in memory and then used as the condition of continuity when generating auxiliary curves thereby ensuring that the auxiliary curve is continuous with any adjoining surfaces of the surface for which the auxiliary curve is generated thus indicating that a first NxM surface generated adjacent to a second NxM surface would have a NxM surface condition to match the second NxM surface condition of the second surface in order to ensure continuity between the adjacent surfaces, see Figs. 20-21; column 5, lines 20-29 and 35-48. Thus the combination of primary reference Maya 2.0 with secondary reference Konno et al. teaches all of the elements of claims 30 and 41 as they are currently claimed.

Appellant then argues, with respect to claim 30, that "Claim 30 also requires, in response to determining that the plurality of curves constitute, a P x 1 surface condition and using the computing system, converting the P x 1 surface condition into an N x M surface condition by generating at least one auxiliary curve that is substantially continuous with any adjoining surfaces of the first surface and compatible with the number of first curves and the only one second curve that define the P x 1 surface condition..... First, as the prior "determining" step does not take place in the references, the references cannot teach that this step is performed in response to it."

Examiner respectfully submits that Appellant has not defined an explicit method for performing the determination of the surface condition. However, Appellant has

provided teachings in the BACKGROUND OF THE INVENTION section of the specification that the characteristics of a particular surface, such as its shape and orientation, are defined by curves and that a curve is defined by a graph of a mathematical function. The section further teaches that because a surface is defined by the curves, it is modified by adjusting, adding, or deleting the curves and that the number of curves that define a surface identifies the method by which that surface is generated. Appellant further teaches in this section that drawing packages impose modification restrictions on each surface based on the method that was used to generate the surface and also impose modification restrictions on each curve based on the mathematical equation that defines the curve and because of these restrictions, a user must keep track of the method that was used to generate each surface that the user wants to modify and the user must also keep track of the mathematical characteristics of each curve that the user wants to modify thus making it inconvenient and inefficient for the user to modify or edit a drawing, see pages 2-3 of Appellants specification as originally filed. Thus Appellant implicitly teaches that the drawing packages themselves are determining the surface condition for each surface of the drawing and in response to these drawing packages determining the surface condition/method by which these surfaces are generated, imposing modification restrictions since this knowledge is required in order to impose the modification restrictions. While the Appellant has not explicitly indicated that the disclosure in the BACKGROUND OF THE INVENTION section of the specification is "prior art" per se, one of ordinary skill in the art at the time of invention would recognize the disclosure in

this section as indicative of common knowledge in the art at the time of invention particularly when one considers the statement of the problem to be solved found on page 4, lines 19-28 of Appellants specification. It is noted that Examiner is referring to sections of Appellants specification in order to clarify the Examiner's interpretation of the claim limitations and how they may be rejected by the cited art in order to increase Appellants understanding of the rejection and the cited art that has been applied.

Examiner respectfully submits that Maya 2.0, page 43-49, Using the Birail 1 Tool indicates, in the first paragraph, that the Birail 1 Tool constructs a surface by sweeping one profile curve along two rails curves thus indicating a 2x1 method, thus it would be reasonable for one of ordinary skill in the art at the time of invention to understand that the birail 1 surface is defined by 2 rail curves and one profile curve in a P x 1 surface with P greater than 1, in other words a 2 x 1 surface thus indicating both the method and "surface condition" of the surface being generated. Konno et al. teaches that the G^1 continuity of the boundary curve is checked at the endpoints and saved in memory and then used as the condition of continuity when generating auxiliary curves thereby ensuring that the auxiliary curve is continuous with any adjoining surfaces of the surface for which the auxiliary curve is generated thus indicating that a first NxM surface generated adjacent to a second NxM surface would have a NxM surface condition to match the second NxM surface condition of the second surface in order to ensure continuity between the adjacent surfaces, see Figs. 20-21; column 5, lines 20-29 and 35-48. Thus the combination of primary reference Maya 2.0 with secondary reference Konno et al. teaches all of the elements of claims 30 and 41 as they are currently

claimed. It is noted that the processes of Maya 2.0 and Konno for generating surfaces and ensuring continuity are the same processes defined by the Appellant in their specification and thus the results generated from the combined processes of Maya 2.0 and Konno et al. do not differ from the results of the instant application.

Appellant then argues, with respect to claim 30, that "...Maya does not describe, at all, how any surface is defined by the system, whether by a Px1 surface condition, or an NxM surface condition, or otherwise. There is simply no such teaching, nor would there be in a user manual. As none of this information is described, there can be no implication that adding additional curves would determine any new surface having a specific surface condition."

Examiner respectfully submits that Maya 2.0, page 20, Extruding surfaces indicates, in the first paragraph, that the Extrude method constructs a surface by moving a cross sectional profile curve along a path by sweeping and under the first subheading "To create an extruded surface:" the first paragraph states that you need at least two curves to create an extruded surface: a path curve and a profile curve, thus one of ordinary skill in the art at the time of invention would reasonable understand that a surface defined by the least number of required curves in a P x 1 surface with P equal to 1, in other words a 1 x 1 surface thus indicating both the method and "surface condition" of the surface being generated. Konno et al. teaches that the G^1 continuity of the boundary curve is checked at the endpoints and saved in memory and then used as the condition of continuity when generating auxiliary curves thereby ensuring that the auxiliary curve is continuous with any adjoining surfaces of the surface for which the

auxiliary curve is generated thus indicating that a first NxM surface generated adjacent to a second NxM surface would have a NxM surface condition to match the second NxM surface condition of the second surface in order to ensure continuity between the adjacent surfaces, see Figs. 20-21; column 5, lines 20-29 and 35-48. Since Maya 2.0 teaches a method of generating a surface using at least one profile curve and one path curve and since Appellant has indicated that the method for generating a surface defines the "surface condition" and is expressed identically, see Examiners response above, since Appellant has not disclosed how the determinations are made then one must conclude that any determination or definition of a surface based on the method by which the surface is generated is sufficient to determine the "surface condition" as currently claimed. Thus, the combination of primary reference Maya 2.0 with secondary reference Konno et al. teaches all of the elements of claims 30 and 41 as they are currently claimed.

Appellant then argues, with respect to claim 30, that "...Examiner does not specifically address this limitation at all, but it is clear that nothing in the cited references teaches or suggests constructing any surface under any specific surface condition, and certainly not constructing on (sic) under an NxM surface condition that is converted from a Px1 surface condition."

Examiner respectfully submits that Appellant discloses in the specification, page 20, line 26, through page 21, line 6, that a **P x 1 surface condition** (emphasis added) is converted to an **NxM surface condition** (emphasis added) by creating one or more auxiliary curves for any surface having a Px1 surface condition. Appellant further

discloses that the conversion of the Px1 surface condition to the NxM surface condition may be obtained by sweeping the section curve along the guide curve or by sweeping the guide curve along the section curve by mathematically extrapolating a curve along another intersecting curve so that the extrapolation creates the appearance of a continuous surface and may be performed using any appropriate mathematical algorithm, see page 21, lines 15-29. Thus, as disclosed in Appellants specification, one of ordinary skill in the art at the time of invention would understand that the combination of Maya 2.0 wherein surfaces are generated using a sweep of a first curve along an intersecting curve such that a Px1 surface condition is converted to an NxM surface condition during the generation of a NxM surface from an initial Px1 surface is equivalent to what is disclosed in the specification, see Maya 2.0, page 43-49, and Konno et al. wherein at least one auxiliary curve is generated that is substantially continuous with any adjoining surfaces of the first surface, Figs. 20-21; column 5, lines 20-29 and 35-48, i.e. the G1 continuity of the boundary curve is checked at the endpoints and saved in memory and then used as the condition of continuity when generating auxiliary curves thereby ensuring that the auxiliary curve is continuous with any adjoining surfaces of the surface for which the auxiliary curve is generated teaches all of the claim limitations of claims 30 and 41 as indicated above.

Appellant then argues, with respect to claim 30, that the cited references allow a drawing to be edited but that they do not teach editing an NxM surface constructed under an NxM surface condition that was converted from a Px1 surface condition.

Examiner respectfully submits that, as admitted by the Appellant, see argument above, Maya 2.0 allow drawings to be edited, since the specification teaches that the Px1 surface may be converted to an NxM surface by creating one or more auxiliary curves for any surface having a Px1 surface condition in the manner indicated above, see specification, page 21, lines 15-29, then one of ordinary skill in the art at the time of invention would recognize that Maya 2.0 teaches wherein surfaces are generated using a sweep of a first curve along an intersecting curve such that a Px1 surface condition is converted to an NxM surface condition during the generation of a NxM surface from an initial Px1 surface, see Maya 2.0, page 43-49, and therefore any subsequent editing of surfaces would be understood by one of ordinary skill in the art at the time of invention to be editing an NxM surface constructed under an NxM surface condition as claimed.

Appellant provides a statement indicating that the limitations and Examiner's rejections of claims 31-34 are similar to those addressed above for claims 26-29, and incorporates by reference the previously presented arguments with respect to those claims, thus Examiner requests that Appellant look to the response provided above with respect to claims 26-29.

Appellant then provides a statement, with respect to claim 41, that claim 41 includes similar limitations and may be considered together and the arguments made above with regards to claims 24 and 35 are to be incorporated by reference.

Examiner notes that the statement, with regards to claim 41, that "These independent claims include similar limitations, and may be considered together..." appears to have been made in error since claim 41 is a single independent claim.

Examiner further notes that claim 41 also includes limitations that are similar in scope to independent claim 30, see lines 6-9, in that neither claim 41 or claim 30 address the limitation of determining a second surface having a first NxM surface condition and both claim 41 and claim 30 require that the Px1 surface condition includes wherein P is an integer greater than 1.

Appellant further indicates, with regards to claim 41, that the Examiner doesn't address many limitations of this claim at all and makes a circular reference that "the rationale for claim 41 is incorporated herein" and that no prima facie rejection of this claim is provided.

Examiner respectfully submits that the "circular reference" indicated by the Appellant is clearly a typographical error as evidenced by the rest of the paragraph, "the rationale for claim 41 is incorporated herein, Maya Unlimited 2.0, as modified above, teaches all of the elements of claim 41 that is similar in scope to claim 30 above and further teaches a software program for performing the method of claim 30 using the IRIX or Windows NT operating systems...", the typographical error is corrected in the rejection above.

Appellant then argues, with respect to claim 41, that "Claim 41 requires "determine that a first surface of a drawing comprises a first plurality of curves constituting a P x 1 surface condition, the P x 1 surface condition being defined by a number of first curves equal to P and only one second curve, wherein P is an integer greater than one". As discussed above, these limitations are not taught by any combination of Maya and Konno. Nothing in any of these cited portions, nor any other

part of the cited art, teaches or suggests by using a computing system, determining that a first surface of a drawing comprises a first plurality of curves constituting a P x 1 surface condition, a P x 1 surface condition being defined by a number of first curves equal to P and only one second curve, wherein P is an integer greater than one. Claim 41 specifically requires a computer readable medium coupled to the computer system, the computer readable medium comprising a software program operable to determine that a first surface of a drawing comprises a first plurality of curves constituting a P x 1 surface condition."

Examiner respectfully submits that Appellant does not specifically disclose steps for determining the surface condition of a surface. Appellant merely discloses that the surface condition of a surface is expressed in U x V format, wherein the surface condition refers to the respective numbers of section curves and guide curves that, in combination, may define a surface and that the method used to generate a surface is also expressed in the U x V format and that the combination of two section curves and one guide curve, with or without the resulting surface, constitutes a 2X1 surface condition, see page 9, lines 21, through page 10, line 3. Thus, as defined in the specification, Maya teaches determining that a first surface of a drawing constitutes a Px1 surface condition when the surface is defined by P section curves and only 1 guiding curve, and determining that a second surface of a drawing comprises an NxM surface when the surface is defined by N section curves and M guiding curves, see Pages 20-21, Extruding Surfaces; Pages 21-22, Choosing the extrude style; Page 34, Adding curves to Lofted surfaces; Page 43, Using the Birail 1 Tool, i.e. once an NxM

surface has been generated via extrusion, lofting or the Birail Tools, it is understood that additional curves may be added/selected such that a first surface having a Px1 surface condition is determined. It is noted that Appellant does not specifically disclose how the determining step is performed and therefore any method of defining a surface in a U,V direction is sufficient to disclose such limitations. Thus, it would be obvious to one of ordinary skill at the time of invention to understand that defining a surface by a number of curves in the U x V coordinates is equivalent to determining the surface condition of the surface being defined such that a surface defined with a plurality of U first curves and a single V curve would constitute a U x 1 surface condition being determined.

With regards to the requirement of a computer readable medium coupled to the computer system and comprising a software program, Examiner respectfully submits that Maya 2.0 teaches instructions for installing software and using the software with either the Windows NT operating system or IRIX thus indicating that the Maya software application is installed in a computer system running the operating systems described, see page 16, Installing Maya and Transition Guide for Maya IRIX Users; page 17, About This Book. Konno et al. teaches a computer-aided design (CAD) system and apparatus having a user interface, receiving means, processing means and memory means for receiving and processing curve mesh data to generate surfaces and storing said surfaces in memory, see Fig. 1; column 4, lines 39-62; column 13-14, lines 24-18. Thus the combination of primary reference Maya 2.0 with secondary reference Konno et al. teaches a computer system and a computer readable medium coupled to the computer

system and comprising a software program since these devices are inherent to any computer or computer-aided design (CAD) system.

Appellant then argues, with respect to claim 41, that the "...nothing in Maya describes at all if any surface in the system is defined by any specific surface condition. The Examiner has made no showing at all that any surface is determined to comprise specific curves. "

Examiner respectfully submits that Appellant has not explicitly defined how the "surface condition" is to be determined other than to indicate that the "surface condition" is determined based on the method by which the surface is generated and that both the method and the "surface condition" are identically expressed in the UxV format. Thus, one of ordinary skill in the art at the time of invention would reasonably conclude that any drawing application that defines a surface by the method by which it is generated is in effect defining the surface by its "surface condition", see Maya 2.0, page 20, Extruding surfaces, indicates, in the first paragraph, that the Extrude method constructs a surface by moving a cross sectional profile curve along a path by sweeping and under the first subheading "To create an extruded surface:" the first paragraph states that you need at least two curves to create an extruded surface: a path curve and a profile curve, thus one of ordinary skill in the art at the time of invention would reasonable understand that a surface defined by the least number of required curves in a P x 1 surface with P equal to 1, in other words a 1 x 1 surface thus indicating both the method and "surface condition" of the surface being generated.

Appellant then argues, with respect to claim 41, that "Since none of the cited references are concerned with identifying the various surface conditions that define the surfaces of a drawing, so that one or more of the surfaces can be replaced with surfaces having uniform surface conditions, it is clear that none of the references would address this specific limitation."

In response to Appellant's argument that the references fail to show certain features of Appellant's invention, it is noted that the features upon which Appellant relies (i.e., identifying the various surface conditions that define the surfaces of a drawing, so that one or more of the surfaces can be replaced with surfaces having uniform surface conditions, Appeal Brief, page 41, lines 5-8) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Examiner respectfully submits that Maya 2.0, page 20, Extruding surfaces indicates, in the first paragraph, that the Extrude method constructs a surface by moving a cross sectional profile curve along a path by sweeping and under the first subheading "To create an extruded surface:" the first paragraph states that you need at least two curves to create an extruded surface: a path curve and a profile curve, thus one of ordinary skill in the art at the time of invention would reasonable understand that a surface defined by the least number of required curves in a P x 1 surface with P equal to 1, in other words a 1 x 1 surface thus indicating both the method and "surface condition" of the surface being generated. Konno et al. teaches that the G^1 continuity of

the boundary curve is checked at the endpoints and saved in memory and then used as the condition of continuity when generating auxiliary curves thereby ensuring that the auxiliary curve is continuous with any adjoining surfaces of the surface for which the auxiliary curve is generated thus indicating that a first NxM surface generated adjacent to a second NxM surface would have a NxM surface condition to match the second NxM surface condition of the second surface in order to ensure continuity between the adjacent surfaces, see Figs. 20-21; column 5, lines 20-29 and 35-48. Thus the combination of primary reference Maya 2.0 with secondary reference Konno et al. teaches all of the elements of claims 30 and 41 as they are currently claimed.

Appellant then argues, with respect to claim 41, that "...Maya does not describe, at all, how any surface is defined by the system, whether by a Px1 surface condition, or an NxM surface condition, or otherwise. There is simply no such teaching, nor would there be in a user manual. As none of this information is described, there can be no implication that adding additional curves would determine any new surface having a specific surface condition."

Examiner respectfully submits that Maya 2.0, page 20, Extruding surfaces indicates, in the first paragraph, that the Extrude method constructs a surface by moving a cross sectional profile curve along a path by sweeping and under the first subheading "To create an extruded surface:" the first paragraph states that you need at least two curves to create an extruded surface: a path curve and a profile curve, thus one of ordinary skill in the art at the time of invention would reasonable understand that a surface defined by the least number of required curves in a P x 1 surface with P equal

to 1, in other words a 1 x 1 surface thus indicating both the method and "surface condition" of the surface being generated. Konno et al. teaches that the G^1 continuity of the boundary curve is checked at the endpoints and saved in memory and then used as the condition of continuity when generating auxiliary curves thereby ensuring that the auxiliary curve is continuous with any adjoining surfaces of the surface for which the auxiliary curve is generated thus indicating that a first NxM surface generated adjacent to a second NxM surface would have a NxM surface condition to match the second NxM surface condition of the second surface in order to ensure continuity between the adjacent surfaces, see Figs. 20-21; column 5, lines 20-29 and 35-48. Since Maya 2.0 teaches a method of generating a surface using at least one profile curve and one path curve and since Appellant has indicated that the method for generating a surface defines the "surface condition" and is expressed identically, see Examiners response above, since Appellant has not disclosed how the determinations are made then one must conclude that any determination or definition of a surface based on the method by which the surface is generated is sufficient to determine the "surface condition" as currently claimed. Thus, the combination of primary reference Maya 2.0 with secondary reference Konno et al. teaches all of the elements of claims 30 and 41 as they are currently claimed.

Appellant then argues, with respect to claim 41, that "Nothing in any reference addresses the limitation regarding "the third and fourth curves mathematically filling the space of the surface plane defined by the first curves and the only one second

curve". The Examiner does not address this limitation of claim 41 at all, and there can be no proper rejection of claims 41-46."

Examiner respectfully submits that Appellant has not defined an explicit method for performing the determination of the surface condition. However, Appellant has provided teachings in the BACKGROUND OF THE INVENTION section of the specification that the characteristics of a particular surface, such as its shape and orientation, are defined by curves and that a curve is defined by a graph of a mathematical function. The section further teaches that because a surface is defined by the curves, it is modified by adjusting, adding, or deleting the curves and that the number of curves that define a surface identifies the method by which that surface is generated. Appellant further teaches in this section that drawing packages impose modification restrictions on each surface based on the method that was used to generate the surface and also impose modification restrictions on each curve based on the mathematical equation that defines the curve and because of these restrictions, a user must keep track of the method that was used to generate each surface that the user wants to modify and the user must also keep track of the mathematical characteristics of each curve that the user wants to modify thus making it inconvenient and inefficient for the user to modify or edit a drawing, see pages 2-3 of Appellants specification as originally filed. It is noted that Examiner is referring to sections of Appellants specification in order to clarify the Examiner's interpretation of the claim limitations and how they may be rejected by the cited art in order to increase Appellants understanding of the rejection and the cited art that has been applied.

Examiner further submits that the specific limitation regarding the third and fourth curves mathematically filling the space of the surface plane defined by the first curves and only one second is explicitly addressed in the rejection of claim 30 and therefore the statement that all of the elements of claim 41 that is similar in scope to claim 30 above is taught by Maya 2.0, as modified above, as provided in the rejection of claim 41 indicates Examiners intention to incorporate those teachings even though the rejection in the previous office action contained a clear typographical error as evidenced by the rest of the paragraph, "the rationale for claim 41 is incorporated herein, Maya Unlimited 2.0, as modified above, teaches all of the elements of claim 41 that is similar in scope to claim 30 above and further teaches a software program for performing the method of claim 30 using the IRIX or Windows NT operating systems...", the typographical error is corrected in the rejection above. Thus, as quoted from the rejection of claim 30 above with regards to the Maya 2.0 reference, "the left hand figure on page 43 shows a 2x1 surface comprised of two rail/guiding curves and a single profile curve thus indicating a Px1 surface condition and the figures on the right and bottom show an NxM surface extruded from the 2x1 surface consisting of two rail/guiding curves and ten profile curves thus indicating that the Px1 surface condition is now an NxM surface condition, and since NURBS surfaces are created by default (see page 44 and 48, Output Geometry), and wherein the transform control allows the user to specify whether the profile curves swept along the rail curves are scaled proportionally or non-proportionally (see pages 44-45, Controlling the resulting transformation) then the third and fourth

curves are understood to be mathematically filling the space of the surface plane defined by the profile and rail curves."

Appellant then argues, with respect to claim 41, that "Claim 41 requires, using the computer system, constructing an N x M surface under the second N x M surface condition. The Examiner does not specifically address this limitation at all, but it is clear that nothing in the cited references teaches or suggests constructing any surface under any specific surface condition, and certainly not constructing on under an NxM surface condition that is converted from a Px1 surface condition."

Examiner respectfully submits that the statement that "...Maya 2.0, as modified above, teaches all of the elements of claim 41 that is similar in scope to claim 30 above..." as provided in the rejection of claim 41 indicates Examiners clear intention to incorporate those teachings even though the rejection in the previous Office Action contained a clear typographical error as evidenced by the rest of the paragraph, "the rationale for claim 41 is incorporated herein, Maya Unlimited 2.0, as modified above, teaches all of the elements of claim 41 that is similar in scope to claim 30 above and further teaches a software program for performing the method of claim 30 using the IRIX or Windows NT operating systems...", the typographical error is now corrected in the rejection above.

Appellant then argues, with respect to claim 41, that "...Examiner does not specifically address this limitation at all, but it is clear that nothing in the cited references teaches or suggests constructing any surface under any specific surface condition, and

certainly not constructing on (sic) under an NxM surface condition that is converted from a Px1 surface condition."

Examiner respectfully submits that Appellant discloses in the specification, page 20, line 26, through page 21, line 6, that a **P x 1 surface condition** (emphasis added) is converted to an **NxM surface condition** (emphasis added) by creating one or more auxiliary curves for any surface having a Px1 surface condition. Appellant further discloses that the conversion of the Px1 surface condition to the NxM surface condition may be obtained by sweeping the section curve along the guide curve or by sweeping the guide curve along the section curve by mathematically extrapolating a curve along another intersecting curve so that the extrapolation creates the appearance of a continuous surface and may be performed using any appropriate mathematical algorithm, see page 21, lines 15-29. Thus, as disclosed in Appellants specification, one of ordinary skill in the art at the time of invention would understand that the combination of Maya 2.0 wherein surfaces are generated using a sweep of a first curve along an intersecting curve such that a Px1 surface condition is converted to an NxM surface condition during the generation of a NxM surface from an initial Px1 surface is equivalent to what is disclosed in the specification, see Maya 2.0, page 43-49, and Konno et al. wherein at least one auxiliary curve is generated that is substantially continuous with any adjoining surfaces of the first surface, Figs. 20-21; column 5, lines 20-29 and 35-48, i.e. the G1 continuity of the boundary curve is checked at the endpoints and saved in memory and then used as the condition of continuity when generating auxiliary curves thereby ensuring that the auxiliary curve is continuous with

any adjoining surfaces of the surface for which the auxiliary curve is generated teaches all of the claim limitations of claims 30 and 41 as indicated above.

Appellant then argues, with respect to claim 41, that the cited references allow a drawing to be edited but that they do not teach editing an NxM surface constructed under an NxM surface condition that was converted from a Px1 surface condition.

Examiner respectfully submits that, as admitted by the Appellant, see argument above, Maya 2.0 allow drawings to be edited, since the specification teaches that the Px1 surface may be converted to an NxM surface by creating one or more auxiliary curves for any surface having a Px1 surface condition in the manner indicated above, see specification, page 21, lines 15-29, then one of ordinary skill in the art at the time of invention would recognize that Maya 2.0 teaches wherein surfaces are generated using a sweep of a first curve along an intersecting curve such that a Px1 surface condition is converted to an NxM surface condition during the generation of a NxM surface from an initial Px1 surface, see Maya 2.0, page 43-49, and therefore any subsequent editing of surfaces would be understood by one of ordinary skill in the art at the time of invention to be editing an NxM surface constructed under an NxM surface condition as claimed.

Appellant provides a statement indicating that the limitations and Examiner's rejections of claims 42-46 are similar to those addressed above for claims 26-29 and 36-40, and incorporates by reference the previously presented arguments with respect to those claims, thus Examiner requests that Appellant look to the response provided above with respect to claims 26-29.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Roberta Prendergast/

Examiner, Art Unit 2628

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/Ulka Chauhan/

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